



>>Entry Name: Magnesium silicate (Mg₂SiO₄)

Synonym(s): Magnesium orthosilicate

CAS Registry Number: 10034-94-3

Related CAS Registry Numbers(s): 1343-88-0

Mg₂SiO₄

Molecular Formula: Mg₂O₄Si

Molecular Weight: 140.693

Accurate Mass: 139.926671

Percentage Composition: Mg 34.55%; O 45.49%; Si 19.96%

Use/Importance: Used in the manuf. of refractory bricks

Physical Description: Cryst.

Melting Point: Mp 1910°

Solubility: Insol. H₂O

>>Variant: Mineral-form

Synonym(s): Forsterite

CAS Registry Number: 15118-03-3

Molecular Formula: Mg₂O₄Si

Molecular Weight: 140.693

Accurate Mass: 139.926671

Percentage Composition: Mg 34.55%; O 45.49%; Si 19.96%

Source/Synthesis: Occurs in basic and ultrabasic igneous rocks. Synth. by sol-gel process involving reaction of H₂O₂, H₂O, Si(OMe)₄ and Mg(OMe)₂. Method can be modified to allow homogeneous doping of Cr into magnesium silicate network

Use/Importance: Cr-doped Forsterite has applications as solid-state lasing material (near ir, tunable). Can be used with fibre optic materials. Films can be spin cast from sols.

Physical Description: Green, lemon yellow, white orthorhombic cryst.

References:

- Deer, W.A. *et al.*, *Rock Forming Minerals*, Longman, 1962, **1A**, 1, (*mineral*)
Horiuchi, H. *et al.*, *Am. Mineral.*, 1981, **66**, 568, (*cryst struct*)
Lager, G.A. *et al.*, *J. Appl. Crystallogr.*, 1981, **14**, 137, (*cryst struct, olivine-form*)
Sasaki, S. *et al.*, *J. Geophys. Res.*, B, 1982, **87**, 7829, (*cryst struct, spinel-form*)
Handke, M. *et al.*, *J. Mol. Struct.*, 1982, **79**, 353, (*ir, Raman*)
Pirou, B. *et al.*, *Am. Mineral.*, 1983, **68**, 426, (*Raman, olivine-form*)
Schramm, S. *et al.*, *J.A.C.S.*, 1984, **106**, 2502, (*O-17 nmr*)
Weiden, N. *et al.*, *Z. Naturforsch.*, A, 1985, **40**, 126, (*Si-29 nmr*)
McMillan, P. *et al.*, *Am. Mineral.*, 1987, **72**, 361, (*Raman, spinel-form*)
Petricevic, V. *et al.*, *Appl. Phys. Lett.*, 1988, **52**, 1040, (*use*)
Burlitch, J.M. *et al.*, *Chem. Mater.*, 1991, **3**, 692, (*synth, use*)
Park, D.G. *et al.*, *Chem. Mater.*, 1993, **5**, 518, (*synth, uv-vis, powder struct, epr, sem*)
Yeager, K.E. *et al.*, *Chem. Mater.*, 1993, **5**, 525, (*synth, Si-29 nmr, Raman*)